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EXAMINER

DINH, TAN X

ART UNIT PAPER NUMBER

2653

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/975,525

Applicant(s)

KAWAGUCHI ET AL.

Examiner

TAN X. DINH

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6,9-15,17 and 18 is/are rejected.
- 7) ☒ Claim(s) 7,8 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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1) Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

2) The I.D.S filed 2/05/2002 has been considered by the Examiner. However, the Japan and/or foreign document(s), if they have not been written in English, are considered to the extent that could be understood from the Abstract (in English) and the drawings.

Form PTO-1449 is attached herein.

3) The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested:

MAGNETO-OPTICAL RECORDING MEDIUM HAVING MULTIPLE MAGNETIC LAYERS.

4) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

5) (e) the invention was described in-

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(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6) Claims *1-6,9,10,14 and 18* are rejected under 35 U.S.C. 102(e) as being anticipated by NISHIKIORI et al (6,018,511).

NISHIKIORI et al discloses a magneto-optical recording medium as claimed in claim 1, comprising:

a first magnetic layer of Curie temperature T_{c1} (Figs.7A & 7B, 203. See also Column 4, lines 61-65), a second magnetic layer interpose between first and a third magnetic layer and having Curie temperature T_{c2} lower than Curie temperature T_{c1} of first magnetic layer and Curie temperature T_{c3} of third magnetic layer (Fig.7A & 7B, 204. See also Column 5, lines 4-21.), a third magnetic layer of Curie temperature T_{c3} (Figs.7A & 7B, 205. See column 4, lines 61-65, See also column 5, lines 22-27 for $T_{c1} > T_{c2} < T_{c3}$);

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wherein at least a part of temperature range lower than the Curie temperature T_{c2} , the first magnetic layer is exchange-coupled with second magnetic layer so as to be perpendicularly magnetized and a magnetization of the third magnetic layer is transferred to the first magnetic layer via second magnetic layer due to the exchange coupling (Figs.7A & 7B, at overlap portion between intermediate temperature 212 and low temperature 211, the exchange-coupled between first magnetic layer 203 and second magnetic layer 204 occurs as perpendicular magnetized direction (small arrow from in-plane direction turns into perpendicular direction) and the magnetic domain from third magnetic layer is transferred to first magnetic layer (the perpendicular arrow at first magnetic layer). It is noted that, the intermediate temperature 212 and temperature T_{sw1} are lower than Curie temperature T_{c2} of second magnetic layer 204. See column 13, lines 42-51);

wherein the second magnetic layer is in-plane magnetization state at room temperature (Figs.7A & 7B, in-plane direction of layer 204), and makes transition to perpendicular magnetization state in a temperature range from a critical temperature T_{cR} that is higher than room temperature to the Curie temperature (column 13, lines 45-51. In this case, the temperature T_{sw1} is critical

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temperature which higher than room temperature and lower than Curie temperature T_{c2} of second magnetic layer).

As to claim 2, NISHIKIORI et al shows first and second magnetic layers are in contact with each other in figure 7B, 203 and 204.

As to claims 3, NISHIKIORI et al shows the different between Curie temperature T_{c2} and critical temperature T_{cR} is less than 100°C (column 14, lines 49-64).

As to claim 4, NISHIKIORI et al shows the different between Curie temperatures T_{c1} and T_{c2} is not less than 100°C (column 14, lines

As to claim 5, NISHIKIORI et al shows the Curie temperature T_{c2} is not lower than 130°C and not higher than 160°C (column 14, lines 61-64. In this case $T_{c2} = 140^{\circ}\text{C}$).

As to claim 6, NISHIKIORI et al shows the second magnetic layer includes an alloy selected from the group consisting of GdFe, GdFeCo, etc., (column 15, lines 1-3).

As to claim 9, NISHIKIORI et al shows at temperature above the Curie temperature T_{c2} of second magnetic layer, a domain wall is permitted to move from a perpendicular magnetization region that is magnetized perpendicularly by the exchange coupling with the second magnetic layer to the mask region (Fig.6A & 6B, at

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high temperature are 110 which is higher than T_{c2} , a domain wall is moved from a perpendicular magnetization region by exchange-coupling with second magnetic layer, see the perpendicular arrow at high temperature area 110).

As to claim 10, NISHIKIORI et al shows the second and third magnetic layers are exchange-coupled in a part of temperature range lower the T_{c2} (Fig.7A & 7B, the exchange-coupled of second and third magnetic layers is in overlap region between temperature 211 and 212 which is lower Curie temperature T_{c2} of second magnetic layer).

As to claim 14, NISHIKIORI et al shows the first magnetic layer is in perpendicular magnetization state at room temperature (Fig.7B, the magnetization state of first magnetic layer 203 is in perpendicular magnetization state).

Method claim 18 is drawn to the method of using the corresponding apparatus claimed in claim 1. Therefore method claim 18 is rejected for the same reasons of anticipation (obviousness) as used above. It is noted that the step of detecting a change in polarization plane of reflected light is inherent in magneto-optical reproduction process, without this step, the reproduction process can not be performed.

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7) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8) This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103[©] and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9) Claims 11-13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over NISHIKIORI et al (6,018,511) further in view of MURAKAMI et al (6,519,211).

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NISHIKIORI et al discloses all the subject matter claimed as in claim 11, *except* to specifically show a non-magnetic layer between second and third magnetic layers. MURAKAMI et al from the same field of endeavor teaches a magneto-optical recording medium having multiple magnetic layer wherein a non-magnetic layer is provided between second and third magnetic layer (figure 6B, non-magnetic layer 105. See also column 18, lines 37-49). Since the method of using a non-magnetic layer as taught by MURAKAMI et al is old and well known in the art, it would have been obvious to someone of ordinary skill in the art at the time of the invention was made to include a non-magnetic layer in NISHIKIORI et al's magneto-optical recording medium as claimed.

As to claim 12, it would have been obvious matter of design choice to modify the MURAKAMI et al's magneto-optical recording medium by having the non-magnetic layer of thickness 1 nm - 10 nm, since applicant has not disclosed that having the non-magnetic layer at this specific thickness ranges could solve any stated problem or is for any particular purpose and it appears that the magneto-optical recording medium would perform equally well with the non-magnetic layer at any specific thicknesses.

As to claim 13, Official Notice is taken that magnetic layer with in-plane magnetization state at room temperature are widely

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used in the magneto-optical art and therefore they are old and well known. It would have been obvious to use the old and well known in-plane magnetic layer in a magneto-optical recording medium such as MURAKAMI et al's because, in the absence of any new or unexpected result, selecting of a known material/element based on its suitability for the intended use is deemed obvious. In re LESHIN, 125 USPQ 416.

Further the magnetic layer is made of multiple magnetic layer and adding fourth magnetic layer to magneto-optical recording medium as claimed in claims 15 and 17 are also old and well known in the art.

10) Claims 7,8 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11) The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objection made. Applicant must also show how the

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amendments avoid such references and objections. See 37 CFR §1.111(c).

FUJI et al (5,936,915 and 5,995,472) discloses a magneto-optical recording medium having first, second and third magnetic layers, the layers having either in-plane or perpendicular magnetization state at room temperature and changes at temperature higher than room temperature.

12) Any inquiry concerning this communication or earlier communications from the Examiner should be directed to TAN DINH whose telephone number is (703)308-4859. The examiner can normally be reached on Monday - Friday from 8:00AM to 5:30PM.

The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4750.



**TAN DINH
PRIMARY EXAMINER**

September 17, 2003